ABSTRACT

The present invention relates to methods and apparatuses for analyzing molecules, particularly polymers, and molecular complexes with extended or rod-like conformations. In particular, the methods and apparatuses are used to identify repetitive information in molecules or molecular ensembles, which is interpreted using an autocorrelation function in order to determine structural information about the molecules. The methods and apparatuses of the invention are used for, *inter alia*, determining the sequence of a nucleic acid, determining the degree of identity of two polymers, determining the spatial separation of specific sites within a polymer, determining the length of a polymer, and determining the velocity with which a molecule penetrates a biological membrane.